

REMARKS

Claims 1-13 remain pending in this application, with claims 5-7 being withdrawn from consideration by the Examiner. Claims 1 and 9 are amended by the current response for clarification purposes.

Rejection of Claim 1 under 35 USC § 102(b)

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Akiyoshi et al. (U.S. Patent No. 4,100,496)

The present invention as claimed in claim 1 recites an apparatus for reducing multipath distortion in a television signal. The apparatus comprises of a plurality of antenna elements for receiving the television signal. Each of the plurality of antenna elements receives a respective one of a plurality of spatially unique signals. Each of the plurality of spatially unique signals is a different replica of the television signal. The apparatus includes an adaptive combiner, coupled to the plurality of antenna elements to generate a weighted spatially combined signal. A receiver, coupled to the adaptive combiner, demodulates the weighted spatially combined signal.

The present invention uses an adaptive combiner to create weighted summations of spatially unique replicas. This “effectively places spatial nulls in the directions of multipath interference. The weighting information is provided by an adaptive controller that uses intelligence from a multipath processor located within the apparatus. The intelligence may take the form of a figure of merit derived from the combiner output, or from processing preformed on the input signals themselves” (page 2, lines 12-17).

Akiyoshi et al. disclose a ghost cancellation device providing at least two antenna bays 14 and 15 (Column 2, lines 30-33). These two antenna bays are placed approximately a quarter wavelength apart to receive separate spatially unique signals. “A phase shifter 16 is inserted in the transmission line from antenna 14 while an amplitude controller 17 is inserted in the transmission line from first antenna 15. The

outputs from the phase shifter 16 and the amplitude controller 17 are combined in a mixer 18 and is applied to a television receiver” (Column 5, lines 5-14).

The Examiner cites that Akiyoshi et al display, in figure 4, a plurality of antenna elements 14, 15 for receiving a television signal, wherein each of said plurality of antenna elements receives a respective one of a plurality of spatially unique signals, each of the plurality of spatially unique signals being a different replica of the television signal. The Examiner further cites that Akiyoshi et al. disclose an adaptive combiner 18, coupled to the plurality of antenna elements 14, 15 for generating a spatially combined signal and a receiver coupled to the adaptive combiner for demodulating the spatially combined signal on column 2, lines 30-44 and column 5, lines 5-17. Akiyoshi et al. disclose a mixer whose output “is delayed and the thus delayed output is mixed with the undelayed output from the mixer so as to control the amplitudes and polarities”. However, Akiyoshi et al neither disclose nor suggest “an adaptive combiner, coupled to said plurality of antenna elements, for generating a weighted spatially combined signal” as claimed in claim 1 of the present invention. Furthermore, even though Akiyoshi et al disclose a receiver coupled to the mixer for demodulating the spatially combined signal, they neither disclose nor suggest “a receiver, coupled to said adaptive combiner, for demodulating said weighted spatially combined signal” as claimed in claim 1 of the present invention.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Akiyoshi et al. showing the above discussed features. It is thus further respectfully submitted that claim 1 is not anticipated by Akiyoshi et al. It is thus, further respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of Claim 9 under 35 USC § 102(b)

Claim 9 is rejected under 35 USC & 102(b) as being anticipated by Tedama et al. (U.S. Patent No.3,573,830).

The present invention as claimed in claim 9 recites a loop antenna. The loop antenna contains a plurality of conductive strips arranged in a circular pattern, where each strip comprises at least one narrowed portion. A feed point is connected to the at least one of the narrowed portion of each strip. A signal coupler for connecting adjacent feed points and thereby for coupling signals from the plurality of conductive strips is provided.

In figure 3A of the present claimed invention a perspective view of an illustrative antenna is shown. The antenna is a “four-port loop antenna comprising a loop 302 formed from four flat strip conductors...having four feed ports 306, and four feed lines 304 coupled to the loop 302 via mechanical couplers 308 ...Each feed line 304 is mechanically coupled to the loop 302 midway between a respective pair of feed ports 306” (page 7, lines 7-14).

Tadama et al. present a directional loop antenna in which a pair of arcuate conductive members are mounted in opposed relation with their concave sides facing each other to define a loop. A dummy load is connected between two of the adjacent ends of the conductive members and output terminals are connected to the opposite adjacent ends. The conductive members are formed with relatively narrow end portions and relatively wide middle portions to increase the frequency band width and gain of the antenna.

The Examiner contends that Tadama et al disclose a loop antenna comprising a plurality of conductive strips arranged in a circular pattern in figures 1-16. The strips comprise at least one narrowed portion, a feed point comprising a gap defined by the at least one narrow portions of each strip, and a signal coupler proximate the feed. Tadama et al disclose a “dummy load...connected between two of the adjacent ends of [the conductive] members...and the output terminals 4a...connected to the other adjacent ends of the conductive members” (Column 3, lines 27-30), they do not disclose nor suggest “a feed point connected to said at least one narrowed portion of each strip” nor “a signal coupler for connecting adjacent feed points and thereby plurality of conductive strips” as claimed in claim 9 of the present invention. The

structure of claim 9 can further be seen in figure 3A which is clearly distinguishable from figures 1-16 of Tadama et al.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Tadama et al. showing the above discussed features. It is thus further respectfully submitted that claim 9 is not anticipated by Tadama et al. It is thus, further respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of Claim 2 under 35 USC § 103(a)

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akiyoshi et al. in view of Tada et al (US Patent No. 4,338,606).

Tada et al teach an antenna system. The antenna system has a loop antenna divided into n conductive members with n pairs of divisional points. The loop antenna has n feeders connected to the n pairs of divisional points.

The Examiner contends that the invention of Tada et al, when combined with Akiyoshi et al, would create a system with multiple n antenna elements receiving individual spatially unique signals and transmitting those signals through n feed points between antennas to a mixer for generating spatially combined signals. However, the combined system neither discloses nor suggests “an adaptive combiner, coupled to said plurality of antenna elements, for generating a weighted spatially combined signal” as claimed in claim 1 of the present invention. Furthermore, the combined system neither discloses nor suggests “a receiver, coupled to said adaptive combiner, for demodulating said weighted spatially combined signal” as claimed in claim 1 of the present invention. Thus, since claim 2 is dependant on claim 1 it is respectfully submitted that claim 2 is patentable for the same reasons as discussed above in reference to claim 1.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Akiyoshi et al.

in view of Tada et al. showing the above discussed features. It is thus further respectfully submitted that claim 2 is not anticipated by Akiyoshi et al. in view of Tada et al. It is thus, further respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of Claims 11 and 12 under 35 USC § 103(a)

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadama et al. in view of O'Connor (US Patent No. 4,121,219).

O'Conner teaches of a dipole resonant loop antenna having a pair of semicircular, quarter-wave antenna elements curving away from each other in a generally circular configuration. O'Conner allows for an impedance matching transformer to be placed inside the boom, which is located diametrically in the circular configuration.

The Examiner contends that the system of O'Conner combined with the system of Tadama et al discloses a plurality of conductive strips arranged in a circular substrate with feed points at the narrow portions and an impedance matching transformer in the signal coupler. However, this combined system neither discloses nor suggests "a feed point connected to said at least one narrowed portion of each strip" nor "a signal coupler for connecting adjacent feed points and thereby plurality of conductive strips" as claimed in claim 9 of the present invention. Thus, since claims 11 and 12 are dependant on claim 9 it is respectfully submitted that claims 11 and 12 are patentable for the same reasons as discussed above in reference to claim 9.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Tadama et al. in view of O'Connor showing the above discussed features. It is thus further respectfully submitted that claims 11-12 are not anticipated by Tadama et al. in view of O'Connor. It is thus, further respectfully submitted that this rejection is satisfied and should be withdrawn.

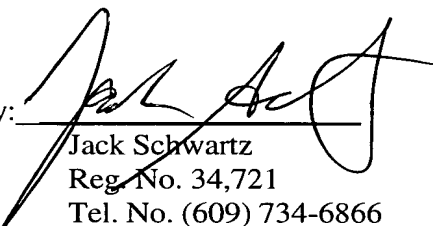
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Claims 3-4, 8, 10 and 13 are indicated as rejected based on their dependence on independent claims 1 and 9. In view of the arguments made above the applicant respectfully submits that claims 3-4, 8, 10 and 13 are patentable and should be allowed for the same reasons as discussed above in reference to claims 1 and 9.

No fee is believed due. However, if a fee is due, please charge the additional fee to Deposit Account 07-0832.

Respectfully submitted,
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